Wireless GPS Receiver
User's Manual

GPS 9537

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1. INTRODUCTION

1.1. Overview

The GPS 9537 Wireless GPS receiver is a Global Positioning System Receiver with Bluetooth wireless technology. This wireless GPS receiver allows you to receive GPS data on mobile handheld wirelessly. By sending GPS position data over Bluetooth, you can position the receiver for the best possible reception all without wires. The advent of wireless GPS receiver will become the next level of GPS receivers.

The GPS 9537 Wireless GPS receiver integrates Bluetooth module into GPS device. It shows the high performance, low power consumption, easily portable, rechargeable & removable battery function and wireless data transmission. If you have a Pocket PC or other portable devices enabled with Bluetooth function, for example iPAQ 3870/3970 and SONY Ericsson T68 mobile phone, you can take advantage of your device's Bluetooth capability to wirelessly add GPS positioning technology. When you choose suitable navigation software, you can apply to personal, vehicle tracking, and marine navigation.

If you use this wireless GPS receiver, you will ignore the messy cords and antenna and add the portability of your Pocket PC. In addition, This wireless GPS receiver can change the exhausted battery to full battery like battery of mobile phone.

1.2. Main Features

- ◆ 12 Channels "All-In-View" Tracking
- ◆ Position accuracy of 10 meters 2D RMS
- ◆ Cold/Warm/Hot Start Time: 45/38/8 Seconds
- ◆ Reacquisition Time: 0.1 seconds
- ◆ RF connector for external GPS antenna
- ◆ Support Standard NMEA-0183
- ◆ Support Trickle Power mode Power Saving
- ◆ Compatible with Bluetooth devices with Serial Port Profile (SPP)
- ◆ Superior Sensitivity for Urban Canyon and Foliage Environment
- ◆ Small, sleek, and lightweight design easily fits in your hand
- ◆ Two LEDs indicating Bluetooth and GPS activity.
- ◆ Lithium-ion battery lasting full working day typical use
- ◆ On/off push button
- ◆ Dimension: 1.77" x 3.27" x 0.71" (45mm x 83mm x 18mm)

2. OPERATION

2.1. Hardware Description

The Bluetooth GPS has two LED light which each has two colors. One is GPS & Charge status LED, that is named LED 2, and the other is Bluetooth & low power status LED, that is named LED 1. The status table of LED shows as follows:

LED State Table

LED1

BT & Low Power LED	**Description**	
LED1 Color and Action	**Bluetooth Active**	**Low Power**
Blue Flash	Yes	No
Purple–Red Flash	Yes	Yes

LED2

GPS & Charge LED	**Description**	
LED2 Color and Action	**Battery Charged**	**Position Fixed**
Dark	No	No
Green Flash	No	Yes
Red	Yes	No
Orange-Red Flash	Yes	Yes

<Note1>When the Bluetooth is active and LED 1 lights, it shows Bluetooth RF function. As long as the Bluetooth RF is transmitting the LED light will flash. When Bluetooth doesn't connect the other Bluetooth device, the LED 1 will be flash periodically. Therefore, it means that it broadcasts message to connect the other device with Bluetooth function. If it connects the other Bluetooth device and transmits data, LED 1 will flash very quickly and look like bright.

<Note 2>When the battery is charging, LED 1 will show purple-red color and flash. The reason that Bluetooth is working cause LED 1 purple-red color. If the GPS receiver go to the end of

charge, LED 1 will show blue color and flash.

2.2. Turn on/off

Turn on To turn on the receiver, press the power button on the topside briefly (0.5 seconds). The left LED(LED 2) indicator will flash briefly. The right LED (LED 1) indicator will start flashing.

Turn off To turn off the receiver, press the power button on the topside for 3 seconds. The LED indicator will flash briefly before switching off the receiver.

2.3. Charging

Low Power The right LED(LED 1) indicator will turn RED (normally BLUE) when battery power becomes low. Connect the receiver to a powers source to continue operation and to recharge the battery.

Charging The left LED(LED 2) indicator will turn RED (or ORANGE) when the battery is being charged. When fully charged, the RED indicator will switch off.

2.4. Bluetooth Communication

Waiting to connect The right LED(LED 1) indicator will flash if there is no communication between the receiver and another device.

Connected The right LED(LED 1) indicator will turn to continuous lighting when the receiver is connected through the wireless link with another device.

2.5. GPS

Navigating The left LED(LED 2) will flash GREEN (or ORANGE when charging) if the receiver is able to determine the current position.

2.6. PIN CODE

The **PIN** code means Personal Identification Number for Bluetooth device and it is also called as **Pass Key**. The Bluetooth GPS receiver has the default PIN Code, and is "**0000**". Generally speaking, there are two steps in Bluetooth connecting. One is pairing process, the other is link process. If you need PIN code to pairing and connect, you can use the default pin code, "**0000**" to connect Bluetooth device. Our GPS receiver belongs to non-safety connecting, you can use in general application to finish connecting.

3. TECHNICAL SPECIFICATIONS

3.1. Electrical Characteristics

	Items	Description
Chipset	GSP2e/LP	SiRF starII LP technology
General	Frequency	L1, 1575.42 MHz
	C/A code	1.023 MHz chip rate
	Channels	12
Accuracy	Position	10 meters, 2D RMS
		7 meters 2D RMS, WAAS corrected
		<5 meters(50%), DGPS corrected
	Velocity	0.1 meters/second
	Time	1 microsecond synchronized to GPS time
Datum	Default	WGS-84
	Other	selectable for other Datum
Acquisition Rate(Open Sky & Stationary Requirements)	Reacquisition	0.1 sec., average
	Snap start	2 sec., average
	Hot start	8 sec., average typical TTFF
	Warm start	38 sec., average typical TTFF
	Cold start	45 sec., average typical TTFF
Acquisition Sensitivity	Hot	23 dB-Hz
	Warm	28 dB-Hz
	Cold	32 dB-Hz
	Tracking Sensitivity	16 dB-Hz
	<Note>32dB Hz is equivalent to -172 dBW	
Dynamic Conditions	Altitude	18,000 meters (60,000 feet) max.
	Velocity	515 meters/second (1000 knots) max.
	Acceleration	4g, max.
	Jerk	20 meters/second^3, max.
Power	Operational Power	**3.3VDC±10%** (from internal Lithium-Ion battery pack)
	Input Power	5VDC±10%
	Battery Source	Rechargeable and removable 900mAh Lithium-Ion battery with 5V DC input charging circuit.
	Battery Charging	Full charge 3 hours
	Backup Power	3.3V (internal on board rechargeable backup battery)
	Operational Current & Power Consumption	Please refer to the following table
Interface	Connection:	Communication via Bluetooth Serial Port Profile(SPP)
	Protocol messages	NMEA-0183 Version 2.20 output protocol
	Output message	Default output format: GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec),VTG(1sec)

■Operational Current & Power Consumption

Measure of Power Consumption		
Status	Current (mA)	Power Consumption(mW)
Power On	75	300
GPS connect BT	70	280
LR-9537 Fix without connecting BT Device.	20	80
LR-9537 Fix with connecting BT Device	100	400

3.2. Other Characteristics

	Items	Description
Environmental Characteristics	Humidity range	5% to 95% No condensing
	Operating temperature range	-20°C to +60°C (-4°F to 140°F)
	Battery discharge	-20°C to +60°C (-4°F to 140°F)
	Battery charge	0°C to +40°C (32°F to 104°F)
	Short period storage temperature (< 1 month)	-20°C to +50°C (-4°F to 112°F)
	Long time storage temperature(>1 month)	-20°C to +35°C (-4°F to 95°F)
Physical Characteristics	Length	3.27" (83 mm)
	Width	1.77" (45mm)
	Height	0.71" (18 mm)
	Weight	1.82 oz / 52g (without chargeable battery) 2.73 oz / 78g (with chargeable battery)
	Antenna connector	MC plug -Note: The internal antenna will be disables when an external antenna is connected.
	Power connector	ψ2.1*5.5*9.5 (The connector look the same as the DC jack of iPAQ 36/38 series PDA.)
Antenna	Antenna type	Built-in Ceramic patch antenna (External antenna optional)

3.3. Firmware Characteristics

Items	Description
Core of firmware	SiRF version 2.3
Baud rate	4800
Code type	NMEA-0183 ASCII
Datum	WGS-84
Protocol message	GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec),VTG(1sec)
Output frequency	1 Hz

4. NOTICES

4.1. Global Positioning System

The Global Positioning System (GPS) is operated and maintained by the Government of the United States of America who are responsible for the availability and the accuracy of the system. Changes in the operation, availability and accuracy may affect the operation of your GPS receiver.

4.2. Aircraft and Hospitals

Use of devices with an antenna is prohibited on most aircraft and in many hospitals. The GPS 9537 Wireless GPS receiver is a receiving and transmitting device with two antenna's and should not be used in these environments.

4.3. Heat Reflective Shields

Modern vehicles may have a heat reflective shield in the windshield, preventing proper GPS signal reception if the receiver is placed under the windshield. To get proper reception:

(a) Use an external antenna, or

(b) Place the receiver in a different position, or

(c) Attach the cradle to the windshield behind the rearview mirror, where many vehicles have an opening in the heat reflective shield, indicated by a black outline.

4.4Important

The information in this document is subject to change without notice. No liability shall be assumed for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the performance or use of this material. This document contains information protected by copyright.

4.5 Battery

This product uses a Lithium-Ion battery. Please charge fully before first use. Operation in low (below 0°C/32°F or high (over 40 C/110°F) temperatures will affect power supply efficiency and the ability to charge the battery. All Lithium-Ion batteries will experience power supply efficiency deterioration over time even if not used and have a limited life expectancy. Permanently powering the battery will reduce life expectancy. Do not use your product in a humid, wet and/or corrosive environment. Do not put, store or leave your product in or near a heat source or in a high temperature location and do not expose it to temperature over 60°C(140°F). Failure to follow these guidelines may cause the Lithium-Ion battery to become hot, explode or ignite and cause injury and/or damage. **THE LITHIUM-ION BATTERY CONTAINED IN THE PRODUCT MUST BE RECYCLED OR DISPOSED OF PROPERLY. USE ONLY WITH SUPPLIED CHARGER(s) AND SUPPLIED AC ADAPTOR FOR BATTERY CHARGING.**

4.6 FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

APPENDIX A SOFTWARE INSTALLATION

iPAQ Bluetooth Setup with Pocket PC software

<Note 1> These steps apply to the PDA with Bluetooth function, for example iPAQ 3870 or 3970 PDA

<Illustration> Bluetooth GPS receiver and iPAQ h3970 device

There are several steps to use Bluetooth GPS(9537) with PDA (Bluetooth Built-in PDA or PDA with Bluetooth CF card) for user. Since the version of BTW-CE (Widcomm Bluetooth Manager) may be different for all PDA, there two operations introduced in the manual.

1. How to Check The Version of Bluetooth Manager

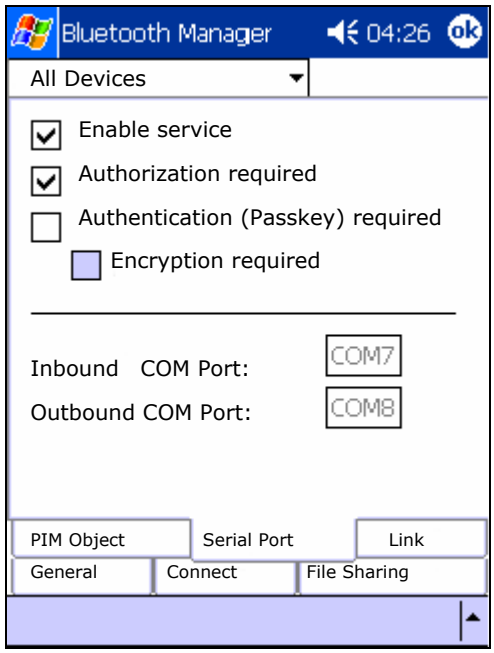
   It's very simple to check the version of BTW-CE. If BTWCE is installed in the PDA, there will be a Bluetooth icon (or) displayed in the right of the bottom of screen. The information and the declaration for copyright of BTWCE will be shown in "about" page.

2. BTWCE 1.1 Bluetooth

(1) Make sure that the Bluetooth Device is powered on.

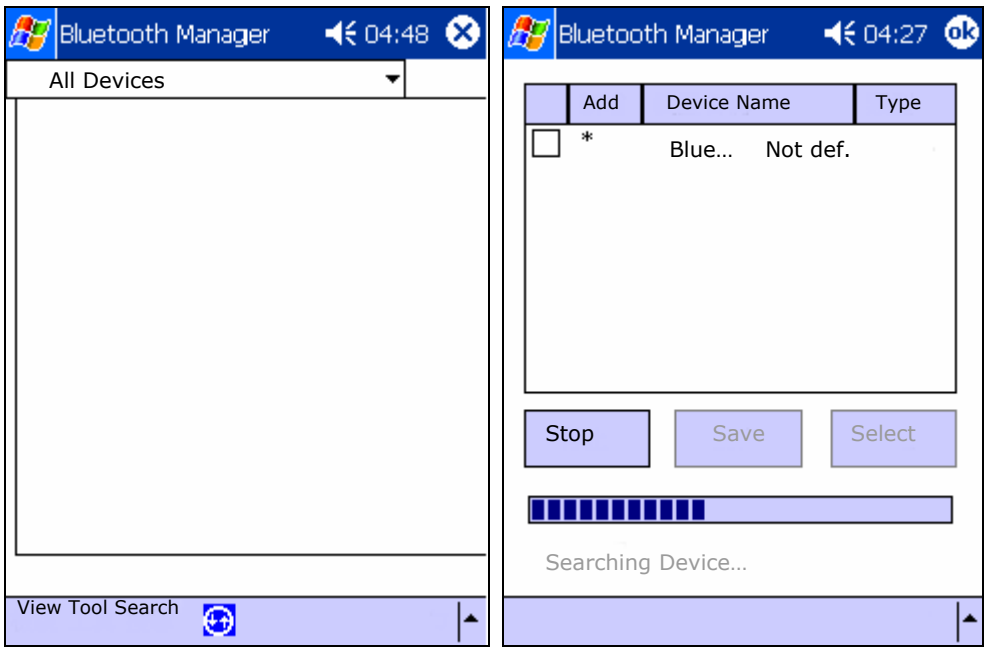
(2) Select "Bluetooth Manager".

(3) When the Bluetooth Manager is executed, the user can check COM port configuration. Choose "Tool", and then select "Setup all Device". Then in "Serial Port" Page, the user will see Outbound COM Port which will be used by application. In this case, the com port is 8.

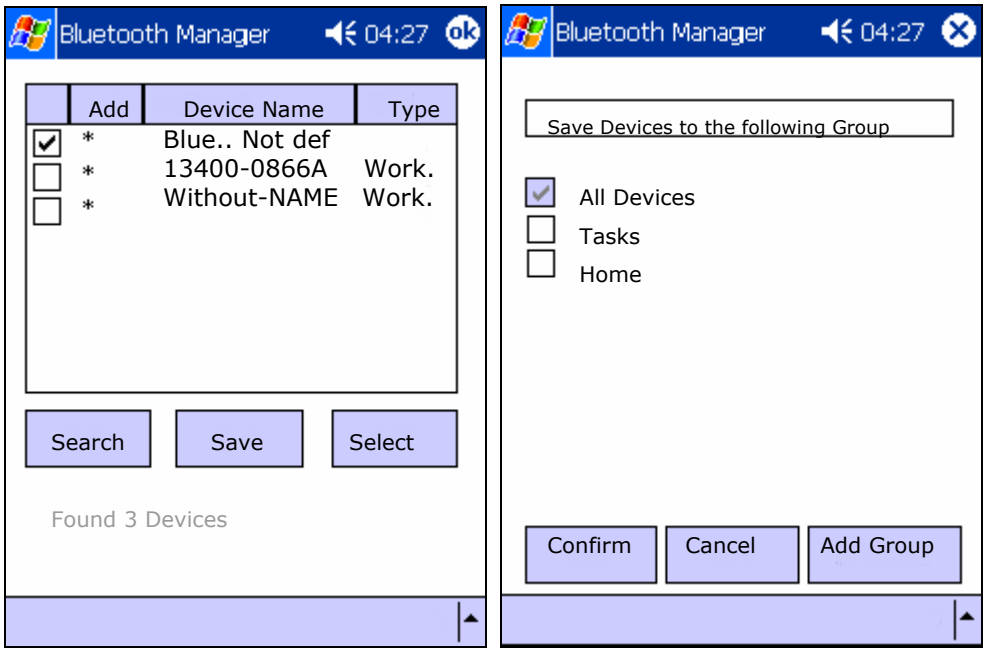


(4) Select "Search" to find target device, then BTW-CE will start to search nearby Bluetooth

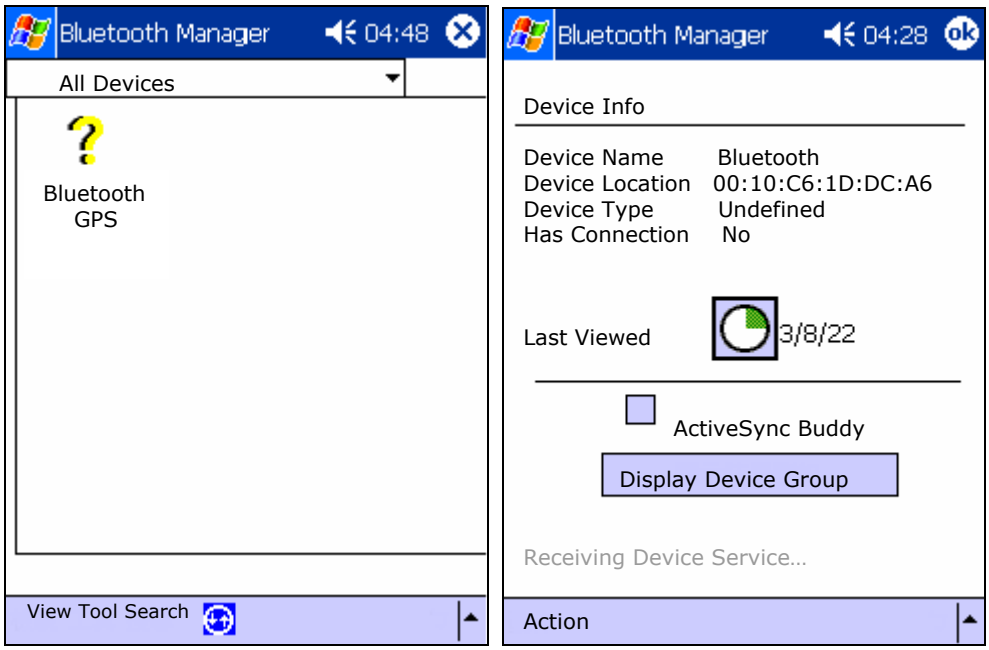
device.



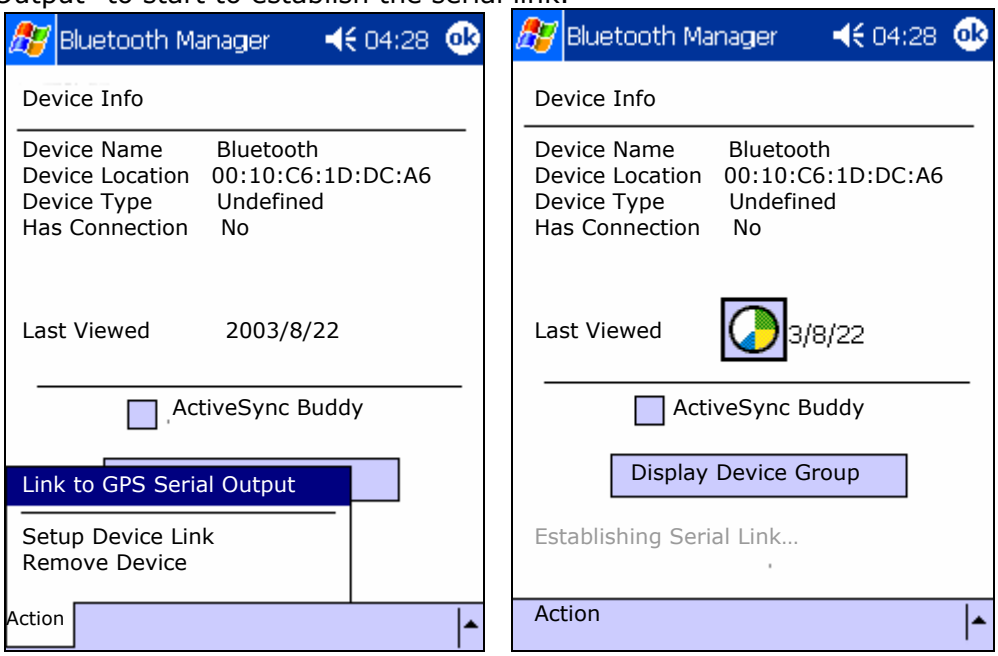
Finishing searching and "Bluetooth GPS" found, select the target and save it for selected group. In this case, the target device is saved to default group. Then click to save the target.

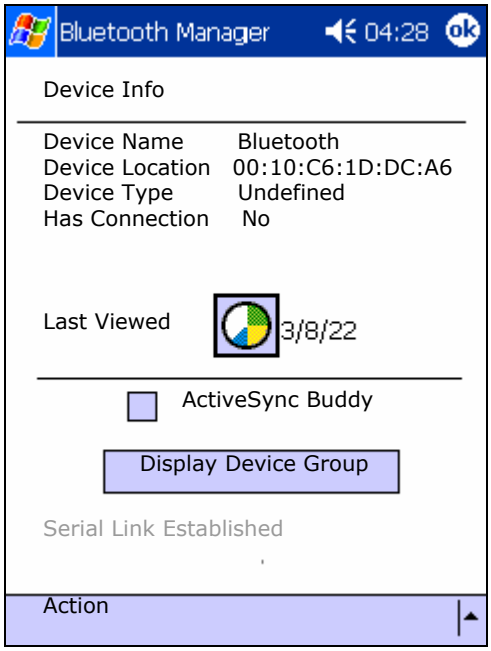


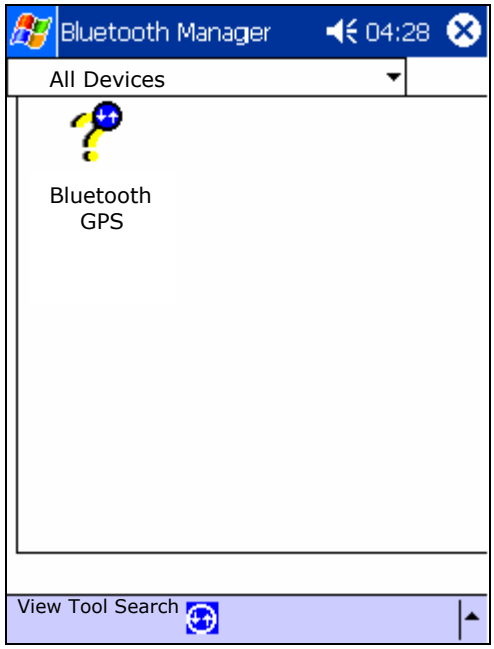
(5) Back to the main form of BTW-CE, if there're devices saved, the device list should seen. Then double-click the target device, BTW-CE will start to search the service provided by the target device for a while. After searching services, if the device is alive, there should be the name of SPP service on the action list.



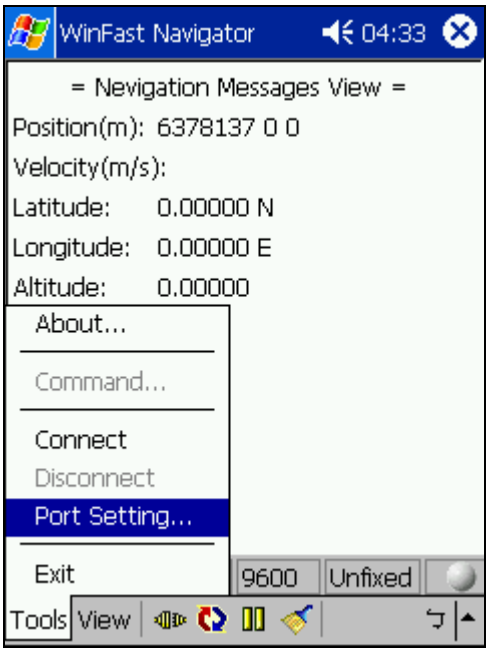
(6) In this case, "GPS Serial Output" is on the list for the SPP service. Select "Link to GPS Serial Output" to start to establish the serial link.

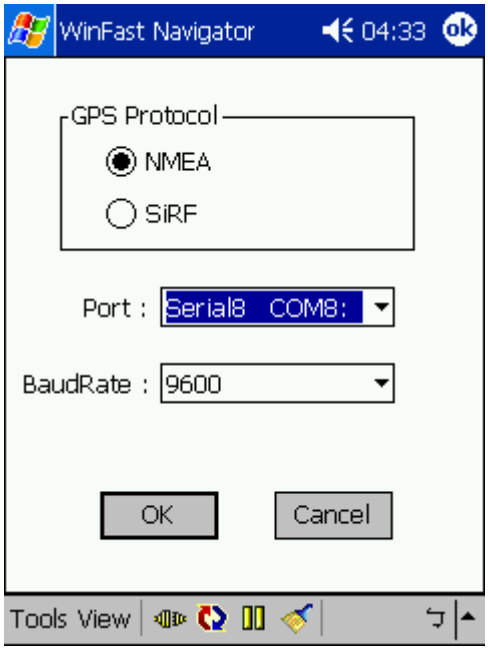


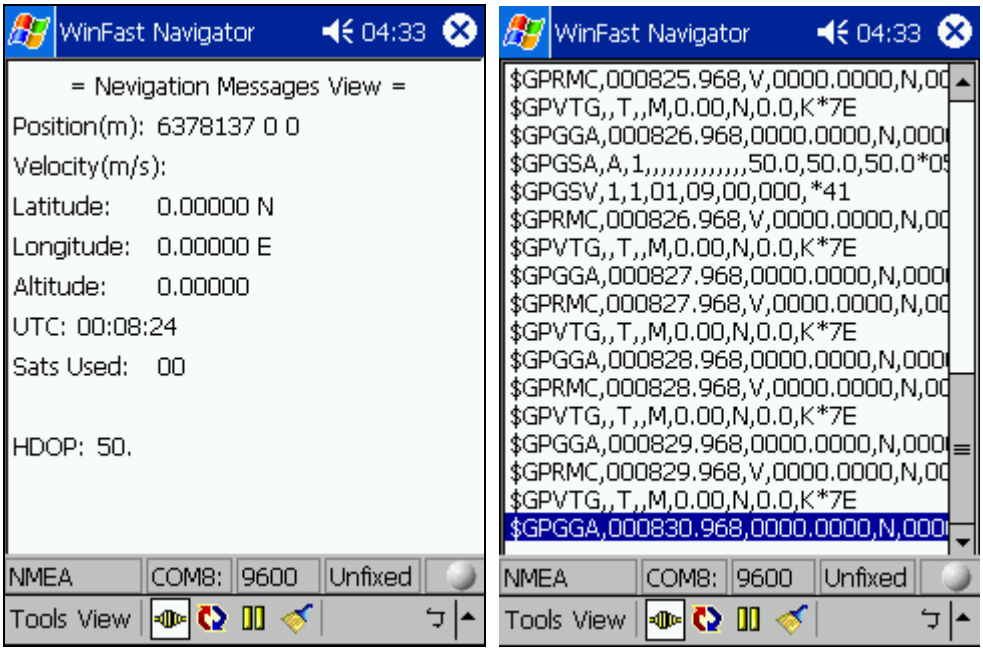




(7) As the connection being established, the port could be used by application.



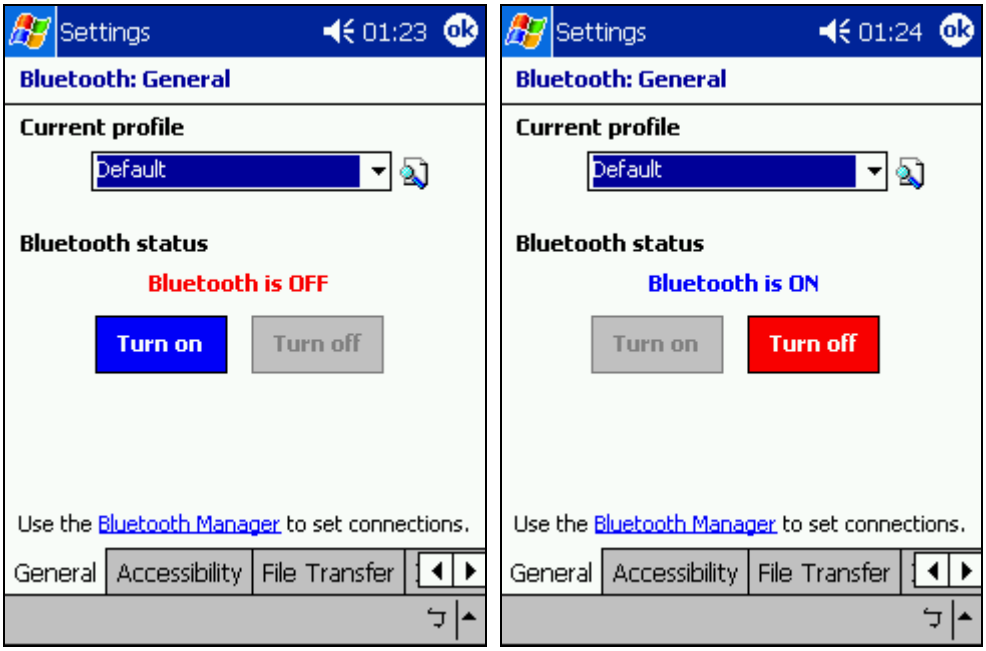




(8) Since BTW-CE will remember the last device linked to, the user doesn't have to go the previous steps when going to use the Bluetooth device. Applications could open the serial port directly, and then BTW-CE will smartly try to connect to the last linked device. However, if there's other device the user want to use, the steps should be done again.

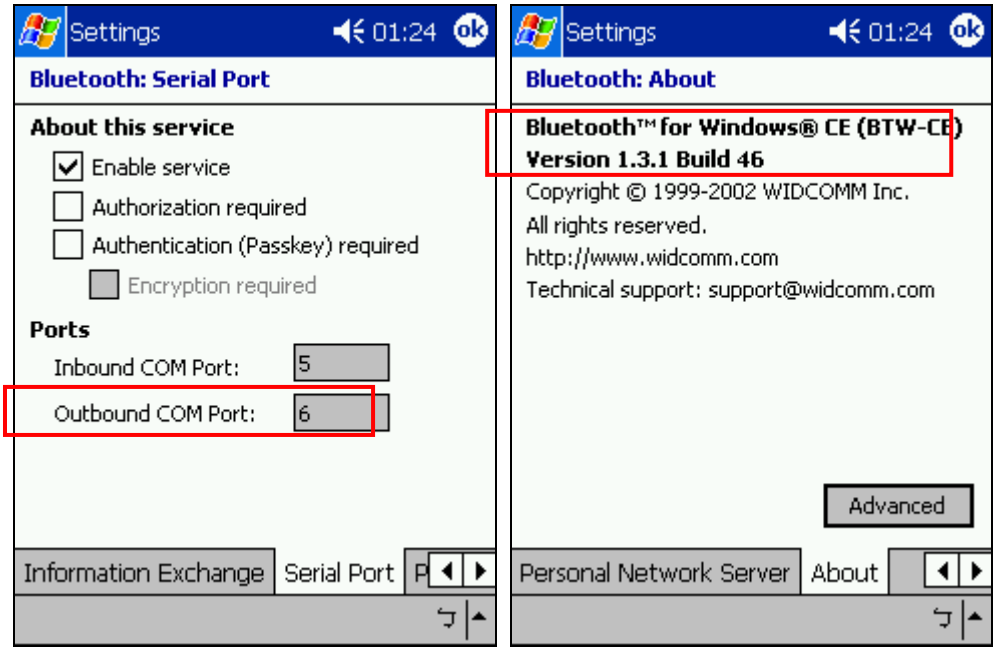
3. BTWCE 1.3

(1) Make sure that the status of Bluetooth is on.

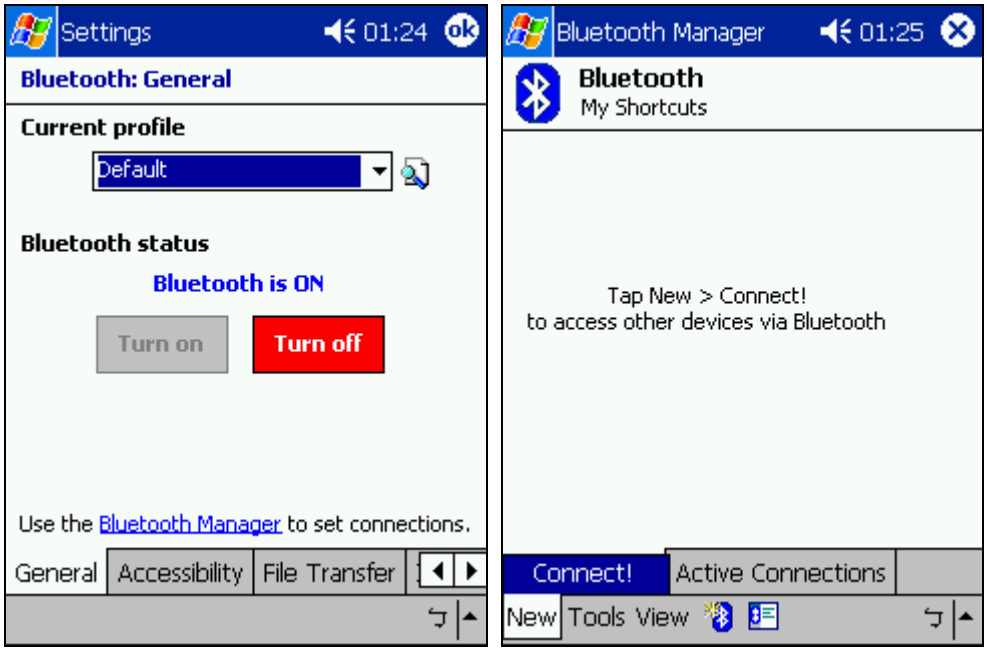


(2) Change the page to "Serial Port", then check which com port used as "Outbound COM

Port". In this case, the number of com port is 6. And then change to "about" page, there should be version string shown.



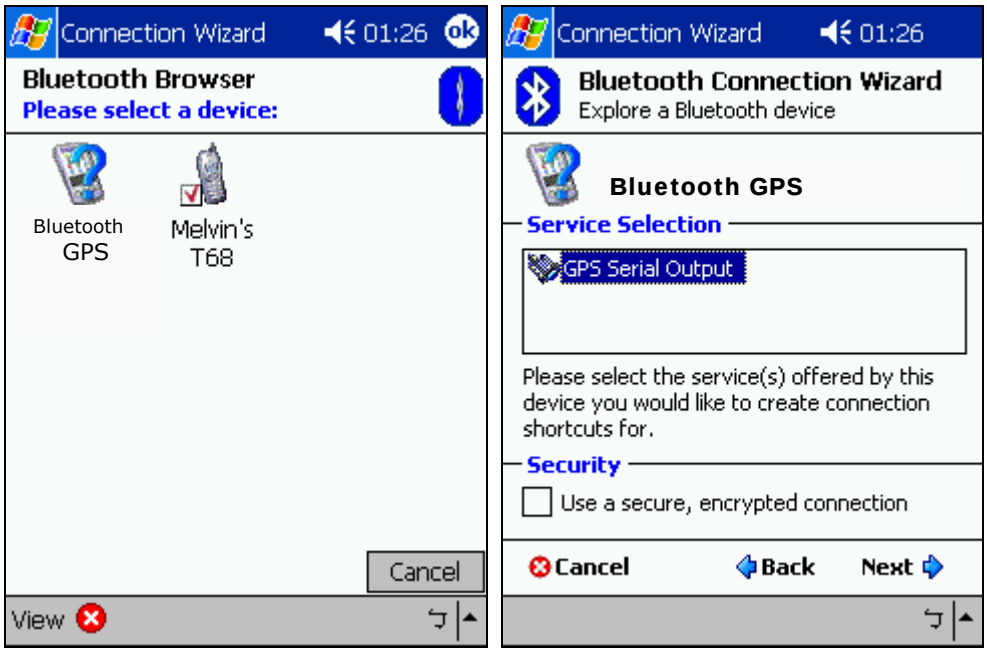
(3) Click the "Bluetooth Manager" in "General" page. Select "New" and "Connect!" to add new device.



(4) Then the Bluetooth Connection Wizard will be executed. Select "Explore a Bluetooth device" and click "Next". Tab the Device frame on the form to start to search.

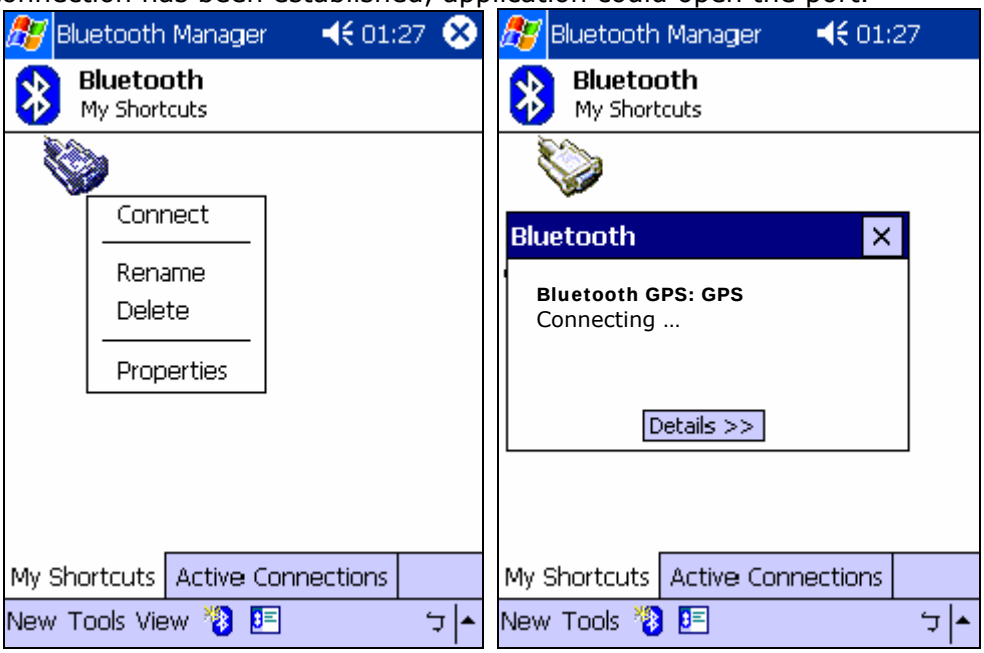
Connection Wizard
01:25
Bluetooth
Connection Wizard
Explore a Bluetooth device
Discover the services another device offers and create connection shortcuts for them.
Connect to the Internet
Access the Internet using a network access point, a cell phone or another connected Bluetooth device.
Join a personal network
Connect two or more Bluetooth devices to share files, collaborate or play multiplayer games.
Partner with a cell phone
Establish a partnership with a cell
Cancel
Next
Connection Wizard
01:25
Bluetooth Connection Wizard
Explore a Bluetooth device
Device:
<No device selected>
Tap here to choose a device
How to use this screen
To select a device, tap inside the device selection box above. After the list appears, choose a device.
Tap 'Next' to continue or 'Back' to return to the previous screen. To exit without completing the connection, tap 'Cancel'.
Cancel
Back
Next

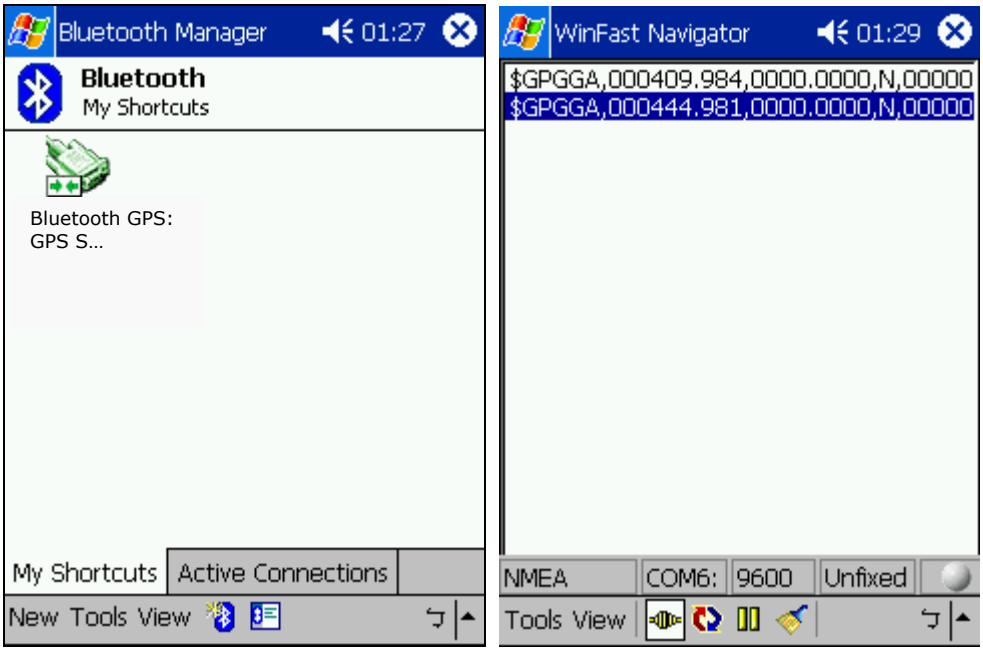
(5) After searching, the found devices will list. Click on the target to find service. If the SPP service is found, the service name will be shown in Device frame. Then select the target service and click “Next”.



(6) After the previous steps, the wizard will show the message to tell the user that the link shortcut has been established. It means that the user could see the shortcut in the Bluetooth Manager.

(7) Select the target and hold on it for a while, then the sub-menu will pop-up. Select "Connect" to establish the link. If successes, the icon of target device will turn into green. As the connection has been established, application could open the port.





BTW-CE 1.3 won't remember the last linked device. Instead, when the application try to open the outbound port, if the port is not link to the target previously, then the Bluetooth Manager will pop-up. And the user would select the shortcut of the target device to complete the connection